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Brief report

Measuring depression in women around menopausal age Towards a validation of the Edinburgh Depression Scale

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Abstract

Background: The relationship between menopause and depression is still rather unclear. Studies using different methodology — especially those lacking a clear definition of depression — are hardly comparable. Since the Edinburgh Depression Scale (EDS) is not influenced by (menopause-related) somatic symptoms, the validity of the Dutch version of this instrument was investigated in a large community sample of menopausal women. *Methods:* In 951 women, aged between 47 and 56 years, depressive symptomatology was measured using the EDS, together with a syndromal diagnosis of depression using Research Diagnostic Criteria. *Results:* Twenty-two percent of the subjects had scores of 12 or higher on the EDS. With this cut-off point, depression (major or minor) was detected with a sensitivity of 66%, a specificity of 89%, and a positive predictive value (PPV) of 62%. A cut-off score of 15 or higher detected half of the women with major depression (sensitivity 73%, specificity 93%, PPV 53%). *Limitations:* Screening of depressive symptomatology at menopausal age in women of the community can only partly detect women with clinical depression. The relation between menopausal status and depression should preferentially be investigated using a longitudinal rather than a cross-sectional design. *Conclusions:* The EDS, which is easy to implement in both community and clinical settings (e.g., General Practice), might be used as an effective screening tool for detecting women at menopausal age who are at risk for depression, followed by clinical evaluation in those with high scores.

Keywords: Menopause; Climacteric; Depression; Edinburgh Depression Scale; Validation

1. Introduction

During the menopausal transition women can suffer from various physical complaints, such as hot flushes, vaginal dryness, and sweating. These complaints are generally accepted to be related to hormonal (estrogens) changes. Moreover, it has been suggested that, during this period, women are also at risk for psychological problems, such as depressed mood, irritability, and decreased sexual interest (Oddens et al., 1994). Studies investigating whether

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women are at risk for depression during the menopausal transition are often criticized because of heterogeneous definitions of menopausal status, the inclusion of variable age ranges which are often too large (35–65 years), small sample sizes, recruitment of women who are not representative of the population of menopausal women (recruitment at climacteric out-patient clinics) and, most importantly, a poor definition of depression (e.g., Avis et al., 1994; Nicol-Smith, 1996). Studies investigating a relationship between hormonal changes and depression during menopause should preferentially be carried out in large (unbiased) community samples, using clear definitions of menopausal state and depression. However, making a syndromal diagnosis of depression in such a large sample is time-consuming and expensive.

One possibility for overcoming these problems could be the use of a self-rating scale as a screening tool to assess depressive symptomatology (with appropriate reliability and validity) followed by clinical evaluation in those with high scores. Moreover, it would be worthwhile if this instrument could also be used outside research settings, more specifically during consultation in general practice and/or at menopausal clinics. Aspects such as user-friendliness (completion within a few minutes), which would benefit both patient and physician, might contribute to such an implementation. The Edinburgh Depression Scale (EDS; Cox et al., 1987, 1996) meets these criteria. In addition, this scale omits items which assess somatic symptoms related to menopause, such as sleeping problems (due to hot flushes or night sweating) and sexual dysfunction (because of vaginal dryness). This study reports on the validation of the Dutch version of the EDS in a large community sample of women around menopausal age.

2. Method

2.1. Subjects

Between September 1994 and September 1995, all women born between 1941 and 1947 ($n = 8503$), living in the city of Eindhoven, The Netherlands, were invited to participate in a large medical screening program to assess bone mineral density, EPOS — Eindhoven Perimenopausal Osteoporosis Study (Smeets-Goevaers et al., 1998). The number of participating women in this study was 6290 (76% of all invited women), of whom 1510 were randomly chosen for a follow-up study. Eighty-two percent of them ($n = 1242$) consented to a 90-min interview at home, during which a syndromal diagnosis of depression was made. Moreover, the respondents filled out a self-rating scale assessing depressive symptomatology. One hundred and fifty women failed to provide complete information and were excluded from further study, together with 141 non-Caucasian women. Hence, the data in this article refer to 951 women aged between 47 and 56 years. The demographic characteristics of this sample (see Table 1) were similar to those of the 6290 women of the original population.

Apart from the written informed consent of the participants, this study was approved by the Medical Ethics Committee of St. Joseph Hospital in Veldhoven, a suburb of Eindhoven.

2.2. Operationalisation

Depressive symptoms were measured using the Edinburgh Depression Scale (EDS; Cox et al., 1996), which was originally developed for use during the postpartum period and was called the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987). The Dutch version of the E(P)DS has been validated among postpartum women in The Netherlands by Pop et al. (1992), and revealed appropriate psychometric characteristics. Recently, the EPDS was validated in a group of non-childbearing mothers (Cox et al., 1996), resulting in new nomenclature: Edinburgh Depression Scale (EDS). It consists of 10 items, to be completed within 5 min. The total score ranges between 0 and 30, with cut-off scores between 11 and 13 (Harris et al., 1989; Murray and Carothers, 1990).

Syndromal diagnosis of depression was made using the Research Diagnostic Criteria (RDC; Spitzer et al., 1978), which distinguish between minor and major depression.

Table 1
Demographic characteristics of 951 randomly selected Dutch Caucasian women around menopausal age[a]

Characteristic	
Mean age (S.D.)	51.7 (2.1)
	N (%)
Marital status	
Married or living together	731 (77.2)
Divorced	103 (10.9)
Widowed	31 (3.3)
Single	72 (7.6)
Other	10 (1.1)
Children	
No children	134 (14.1)
One child	135 (14.2)
Two or more children	679 (71.6)
Employment	505 (53.1)
Education	
Lower education	468 (49.4)
Secondary education	262 (27.7)
Higher education	170 (18.0)
Academic education	23 (2.4)
Not specified/other	24 (2.5)
Gynaecological information	
Hysterectomy	210 (22.6)
Oophorectomy	
Unilateral	68 (7.4)
Bilateral	33 (3.6)
Using hormones	229 (24.2)
Not using hormones	717 (75.8)
Not using hormones, and no hysterectomy and/or bilateral oophorectomy of which:	565 (59.4)
Premenopausal	82 (14.5)
Perimenopausal	243 (43.0)
Postmenopausal	231 (40.9)

[a] Note: Menopausal state only applies to women not having used hormones for at least 6 months, and who have not undergone hysterectomy and/or bilateral oophorectomy, and is defined as: premenopausal, women with unchanged menstruation pattern; perimenopausal, women with irregular menses compared to their usual menstruation pattern, with at least one period in the preceding year; postmenopausal, women with amenorrhoea for at least 1 year.

2.3. Statistics

Statistical analyses were performed using the Statistical Products and Service Solutions (SPSS). The reliability of the EDS was calculated using Cronbach's alpha. The validity of the EDS for the syndromal diagnosis of depression, according to the RDC, was assessed by calculating the sensitivity, specificity and positive predictive value at different cut-off scores.

3. Results

More than a fifth (22.4%) of the women had an EDS score of 12 or higher. According to the RDC, 20.6% of the women were depressed, of whom 10.7% were suffering from minor and 9.9% from major depression. The EDS yielded a mean score of 7.8, ranging from 0 to 29 (S.D. 6.0). The internal consistency (Cronbach's alpha) of the EDS was 0.88.

The validity in terms of the sensitivity, the specificity, and the PPV of the EDS at different cut-off scores (range 10–15), according to the RDC criteria for major depression alone, and for major and minor depression combined, are shown in Table 2. The lower the cut-off score, the higher the sensitivity, and the lower the specificity and PPV. At a cut-off score of 12, 65% of the women were diagnosed as having minor or major depression (sensitivity 66%, specificity 89%). For major depression only, the PPV was 40%, whereas the sensitivity was 88%, and the specificity 85%. Using a cut-off score of 15, it was possible to detect almost three-quarters (73%) of the women suffering from major depression (specificity 93%, PPV 53%).

4. Discussion

This is the first study that reports data concerning the validity of the EDS in women around menopausal age. In comparison with the validation study of the E(P)DS in Dutch postpartum women ($\alpha = 0.82$; Pop et al., 1992), the internal consistency was somewhat better ($\alpha = 0.88$), which might be explained by the higher number of participants in this study (951 compared to 293).

More than 20% (22.4%) of the sample scored 12 or higher on the EDS, a frequently used cut-off score. In the study of Cox et al. (1996), 37 out of 136 (27.2%) non-childbearing women (mean age 27.2 years) had a score of 12 or higher. In a 3-year study using the Center for Epidemiologic Studies

Table 2
Validity of the EDS at different cut-off points, according to the RDC, in a community sample of Dutch Caucasian women around menopausal age

EDS score	RDC major depression			RDC major or minor depression		
	Sensitivity (%)	Specificity (%)	PPV[a] (%)	Sensitivity (%)	Specificity (%)	PPV (%)
10	92	74	28	81	80	51
11	90	80	34	75	85	88
12	88	85	40	66	89	62
13	85	88	44	60	91	64
14	79	92	51	53	94	70
15	73	93	53	48	95	73

[a] PPV, positive predictive value.

Depression Scale (CES-D, a 20-item self-rating scale) carried out on somewhat younger middle-aged women (mean age 48.4 years), Kaufert et al. (1992) reported a point prevalence of 26%. In a recent epidemiological study ($n = 7076$) in The Netherlands (NEMESIS; Bijl et al., 1998) with the Composite International Diagnostic Interview (CIDI), the same pattern of age-related prevalence was found. Taking into account a 2:1 ratio of depression for women and men, Bijl and colleagues found a 1-year prevalence of 10.6% for *syndromal* diagnosis of depression between the ages of 25 and 34 years, of 12.4% at 35–44, and of 11.3% at 45–54, respectively. Using the RDC for the syndromal diagnosis of depression in the present study, the point prevalence for depression (minor and major) was 20.6%. For major depression the point prevalence was 9.9%, which should be compared with the prevalence of 11.3% found with the CIDI in the NEMESIS study.

According to Table 2, the EDS appropriately detects major depression at the cut-off scores of 12 to 15, with a decreasing sensitivity of 88 to 73%, and an increasing PPV of 40 to 53%. These percentages of correctly identified women are acceptable, and are rather similar to those found by Cox et al. (1996). The positive predictive values (PPVs) were not very high, but still twice as high as the rates found by Cox et al., probably due to the small number of women in the latter study. When comparing the EDS cut-off scores 10 to 12 with a diagnosis of major or minor depression on the RDC, the sensitivity rates varied between 66 (EDS 12) and 81% (EDS 10), with PPVs of 51 to 62%. These data show that the EDS has appropriate psychometric characteristics when applied to women around menopausal age.

Although the data concerning the relationship between menopause and depression are rather inconclusive, menopausal women often report somatic and emotional problems. Despite the lack of scientific evidence, there is a general belief that these complaints are related to the declining estrogen production. As a consequence, clinicians often prescribe HRT. However, a clinician should first exclude the possibility of an underlying depression. Syndromal diagnosis of depression by means of a semi-structured interview within the setting of an average consultation (which is, at least in General Practice, 8 to 10 min) is difficult to perform. Therefore, screening of women at risk for depression, preferentially by means of an instrument which could easily be implemented within the consultation setting, would be helpful. The EDS comprises both these characteristics and can also be administered by a health nurse or a GP's assistant. Subsequently, women with high scores on the EDS should have further clinical evaluation.

In conclusion, the EDS can be recommended as a screening instrument of depressive disorder in women around menopausal age.

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